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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Yoshiharu Chikazawa

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09/27/2005

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EXAMINER

PARKER, KENNETH

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 09/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/764,911

Applicant(s)

CHIKAZAWA, YOSHIHARU

Examiner

Kenneth A. Parker

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2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 August 2005.  
2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 3,5-13,16,19 and 20 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 3,5-13,16,19 and 20 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

***Response to Amendment***

***Claim Rejections - 35 USC § 112***

Claim 8 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The limitation of controlling the distance between the camera and the first array has been added, where until now the specification only had the adjustment of the distance between the image forming side and the array.

***Claim Rejections - 35 USC § 103***

**Claims 3, 5-7, 9-13, 16, 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okano "Analysis of resolution limit of Integral Photography" in view of Arai et al, JP 1-227995, Woodgate 6377295, Zeiss DE 29612054U, Sugihara et al IEICE.**

In relationship to claim 20, the reference shows A 3-D display apparatus image capture unit a set of light detecting elements responsive to light from said object to provide an image signal representing said object;  
an image capture array arranged to pass light from said object to the detecting elements spaced from said set of image detecting element by a first distance ( see fig 2 which shows system);

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a display with pixels corresponding to said set of light responsive detecting element and responsive to said image signal to pass light from said light source there-through; the position of the image and the object being the same (fig.1, the relation between the two shows the distances as the same). Not shown is the an image display array with user operable position. Arai et al discloses standard integral photography type systems from both the camera and display sides. Okano et al lacks the adjustability. Akano et al shows an integral photography system where the distance D2 is adjustable (see abstract figures (a) and (b)). Woodgate shows a longitudinal position adjuster in figure 18 which Woodgate indicates enables adjustment of the longitudinal image (column 15, line 56-column 16, line 9), which Woodgate indicates enables getting the image in the right spot is important for comfort. Sugihara IEICE discusses adjusting the spacing to control the mismatch of convergence and accommodation (problem discussed in the first column, solution in page 1816). Sugihara clearly shows this moves the displayed image back and forth (See figure 2).

All of the secondary references show the movement of the arrays relative to each other for the benefit of enabling the user to move and/or to keep accommodation and vergence to the same distance for better user comfort. Therefore, it would have been obvious to one of ordinary skill, in the device of Gulick Jr, to employ the relative movement details as claimed for the benefit on enabling user movement and and/or to keep accommodation and vergence to the same distance for better user comfort.

Manual control would have been obvious to one of ordinary skill compared to automatic as it would have been less costly than any automatic control, and to enable

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the use to find the most comfortable setting. Zeiss '054 shows the motion between the two for the purpose of tracking the user, and Woodgate explicitly indicates manually adjusting the longitudinal position to give the best image quality (column 165, lines 1-9). Therefore one of ordinary skill would have found reason, motivation and suggestion to modify the reference in this manner for the benefits above and further for the best image quality.

The reference further shows the device in relation to claim 3 characterized in that the passive first array is moveable and the second array is stationary (shown by Arai).

The reference further shows the device in relation to claim 5. characterized in that it comprises means for controlling the position of each point of the passive first array and/or each point of the second array (as shown by Arai).

The reference further shows the device in relation to claim 6 characterized in that said means for controlling the position of each point control the distance of the reproduced object to the arrays (as shown by Arai).

The reference further shows the device in relation to claim 7. characterized in that said means for controlling the position of each point control the position of the reproduced object in a direction parallel to the surface of the array representing the object (as is inherent as the system is the same).

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The references further shows the device in relation to claim 9. A 3D display apparatus according to claim 8, characterized in that it comprises sensor means for detecting the position of the viewer. This is taught by Zeiss '084, clearly for the benefit of automating. Therefore one of ordinary skill would have been motivated to implement the modification above with detecting the position of the viewer for the benefit of automating the adjustment.

The reference further shows the device in relation to claims 19, 10, 12 and 16 a 3D display apparatus according to claim 1, characterized in that the second array is a flat surface display, such as a liquid crystal display. Backlit LCDs (which have transmissive pixels) were notoriously well known for better color purity, lightness and taking up less space, and producing more focused light. Some evidence of this is in the Sugihara reference and the '054 Zeiss reference, each of which lists LCD as the display. Therefore one of ordinary skill would have found reason, motivation and suggestion to employ a flat panel LCD for those numerous well established benefits.

The reference further shows the device in relation to claim 11, 13. A 3D display apparatus according to claim 1, characterized in that each point of the passive first array is an aperture of a plate, or a lens (as shown). Apertures and lenses were well known functionally equivalent alternatives. Therefore it would have been obvious to substitute one for the other as they were well known in stereoscopic displays to be substantially interchangeable. Evidence of this is found in the primary reference, which

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lists in figure 2 lists aperture/lens, indicating aperture or lens can be used. This listing may be construed as giving explicit fruition to embodiments of both standard types.

### ***Response to Arguments***

Applicant arguments have been considered. Numerous of the secondary references clearly show moving at least one of the arrays laterally (distance wise), the Sugihara references are unambiguous for the vergence problem, although they show this through figures with arrows instead of word in the description. Applicant argues that the references don't show the moving of the image back and forth, and that the references movement is for tracking the user and user comfort, however- clearly from the references and applicant own specification these are really the same thing. Vergence (means eye angle, ie., convergence or divergence) is based upon where the perceived image is. when the image location doesn't agree with the actual distance, the image location difference (the accommodation and vergence) mismatches give discomfort (see the instant specification or any of the secondary references). If the user position is moved, the image position must be moved accordingly so that it agrees with the actual distance (so accommodation and vergence are in agreement), that is why it is used with head tracking both in the references and in the instant specification (see Sugahara pge 1816, second column, Ziess abstract and Woodgate columns 15-16, as well as in the instant specification the opening of the brief summary indicates "The invention is

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based on the recognition that the position of the reproduced object, even if it corresponds exactly to the original position of the object, may not be the optimum position for the viewer. For instance, depending on the scene, the viewer may have the impression that the object is too far or too close because his eye must accommodate according to the distance or because of subjective reasons...of the head (or eyes) of the observer and this controller is associated with computing means 40 which calculate the optimum position of the reproduced object, i.e. the optimum distance  $d$ , in view of the position of the observer's eyes detected by sensor 38. For instance, the calculation unit may be programmed to set a constant distance between the scene (object) and the observer." So, in fact, the secondary reference teach the exact same benefit as applicants instant invention. Further, user operable control must include a system that automatically adjusts, as applicant specifically claims this in a dependent claim, demonstrating that the automated control fits within applicant's meaning of user control.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth A Parker whose telephone number is 571-272-2298. The examiner can normally be reached on 9:30-6:00.



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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on 571-272-2293. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-1562.



Kenneth A Parker  
Primary Examiner  
Art Unit 2871